

Description of digital values of the real-time AE index

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operated by

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Since December 2024, the digital values of the real-time AE indices have been published in addition to their quick look plots.

Use guidelines

The digital values of the real-time AE index can be used for scientific research in the same way as the provisional AE index. However, the real-time AE in the period when digital values are not published are still for monitoring, diagnostics and forecasting purposes only, as we use raw data without any visual checks. Please note that users should clarify the data version and cite the data DOI when using any version of the AE index. We ask users to use the highest available version of the index (i.e. the final/provisional AE index, if available), so please check whether the final/provisional AE index is available or not before using the real-time AE index.

The digital values have been published on the website https://wdc.kugi.kyoto-u.ac.jp/ae_realtime/data_dir/ within a delay of three weeks. Each data is in /data_dir/YYYY/MM/DD/ (YYYY: 4-digit year, MM: 2-digit month, DD: 2-digit day). One data file contains one component of the AE indices (AU/AL/AE/AO) for one day in a WDC-like format for 1-min AE (<https://wdc.kugi.kyoto-u.ac.jp/aeasy/format/aeformat.html>). The data plot and download service (<https://wdc.kugi.kyoto-u.ac.jp/aeasy/index.html>) does not currently support the real-time AE index but will in the future.

We are publishing real-time digital values going back in time before December 2024. However, please note that we do not accept individual requests to provide or publish data for specific periods.

Data processing

The calculation method of the new version of real-time AE, which includes published digital values, is basically the same as before (see <https://wdc.kugi.kyoto->

u.ac.jp/aedir/ae2/onAEindex.html and https://wdc.kugi.kyoto-u.ac.jp/wdc/pdf/AEDst_version_def_v3.pdf). Before publishing the digital value, we perform a quick quality check on the original geomagnetic data used to calculate the AE index, based on visual inspection and the suggestion of an automatic calibration algorithm. We then correct baselines and remove noises where necessary. This check and correction is quicker than for the provisional index, and if a correction is required, suggestions made by the automatic calibration algorithm are basically adopted as they are. Please note that data publication may be on hold if the data are difficult to correct. Once the digital values have been published, the data and their plots on the website will not be updated, even if the original geomagnetic data are subsequently updated. If you wish to use a higher-quality AE index, please wait for the provisional index to be published.

We currently do not use the average values in international five quietest days as the baseline of geomagnetic data for real-time AE. Since the international five quietest days is published after the end of a month, there are problems with near real-time determination of the baseline. The baseline is therefore determined on an as-needed basis, rather than on a monthly basis, and is based solely on the above data correction, regardless of whether changes in the baseline are due to natural or artificial variations.

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